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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/232,498 01/15/99 MIZUNO

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KENYON & KENYON  
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EXAMINER

RUTHKOSKY, M

ART UNIT

PAPER NUMBER

1745

DATE MAILED:

12/05/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
09/232,498

Applicant(s)  
Mizuno

Examiner  
Ruthkosky, Mark

Group Art Unit  
1745



☒ Responsive to communication(s) filed on Sep 22, 2000

☐ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claim

☒ Claim(s) 1-12 is/are pending in the applicat

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-12 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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## DETAILED ACTION

### *Summary*

1. Claims 1-3, 5-8 and 11-12 are rejected under 35 U.S.C. 103(a). Claims 1-12 stand rejected under 35 U.S.C. 112, second paragraph. Claims 4, 9, and 10 stand objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Claim Rejections - 35 U.S.C. § 112*

2. The rejection of Claims 1-12 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention stands. The claims are to a mixture of two components: a phenol resin and an epoxy resin. It is noted that an epoxy resin may also be a phenol resin and a phenol resin may also be an epoxy resin (for example, see Hasegawa (4,369,238), col. 2, lines 35-50 and WO 99/19389, claim 8). As the claims are to a mixture, the identities of each component must be *clearly defined* in order to understand the proper combination.

3. Claims 3-7 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The word "type" in these claims is indefinite as it does not distinctly claim the resin. The word "type" should be removed from these claims.

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***Claim Rejections - 35 U.S.C. § 103***

4. The rejection of Claims 1-3, 5-8 and 11-12 under 35 U.S.C. 103(a) as being unpatentable over Shigeta (4,956,131), in view of WO99/13989 and further supported by JP 59042781 is withdrawn due to the ineffective date of the WO reference.

5. Claims 1-3, 5-8 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shigeta (4,956,131), in view of JP 59042781.

The instant claims are to a method of manufacturing a separator for a fuel cell comprising the steps of mixing a carbon, an epoxy resin and a phenolic resin, charging the material into a mold and heat pressing the material.

Shigeta (4,956,131) teaches a process for producing an electrode substrate for fuel cells which includes an electrode substrate and separator assembly where the process includes supplying materials into a mold comprising a filler (carbon particles of 50 microns or less), a binder (can be phenol resins, epoxy resins or mixtures thereof), and a pore regulator mixing and press molding the material (claims 1-4). While this process teaches the binder can be a mixture of phenol resins and epoxy resins, it does not teach a process for mixing both types or resins to form a separator (col. 20, line 10).

JP 59042781 (abstract), however, teaches a method for producing a carbon material for a fuel cell comprising the steps of mixing a carbon powder, an epoxy resin and a phenolic resin,

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charging the material into a mold and heat pressing the material. Novolac phenol resins are disclosed. The carbon is graphite less than 100 microns in size.

It would be obvious to one skilled in the art at the time the invention was made to combine the molding composition which is presented in JP 59042781 as the binder of Shigeta as the materials are well known to be mixed and bind carbon to form structures such as separators for fuel cells. The chemical resistance, heat resistance and gas impermeability of the material are improved. The use of such carbonaceous materials, is very well known in fuel cell assemblies.

As the epoxy resin is reacted with the phenolic resin, one of ordinary skill in the art would have the knowledge to choose to react the functional groups in about a 1:1 stoichiometry as the reaction will go to completion and form the desired product. It is also obvious to one of ordinary skill in the art to use cresol novolak and bisphenol A type epoxy resins as the epoxy resin binder in a fuel cell, and resol phenolic resins as the phenol resin binder in a fuel cell. These specific resins are commonly used in the art as binders (see Hasegawa US 4,369,238, claim 2; and Sugaya US 5,128,378, col. 4, lines 60+ as examples.) for polymeric separators in electrochemical devices.

***Allowable Subject Matter***

6. Claims 4, 9, and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims although the rejections under 35 U.S.C. 112 must be overcome.

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***Response to Arguments***

7. Applicant's arguments filed 9/22/2000 have been fully considered but they are not fully persuasive. With regard to the rejections under 35 U.S.C. 112., the examiner notes that the claimed subject matter has read upon in light of the specification which is clearly enabling, however, as the claims are written, the indefinite issues are not overcome by descriptions in the specification. The examiner recommends removing the word "type" from the claims 4-7 and clearly showing in the parent claims that an epoxy resin is a distinct and separate component than the phenolic resin component.

The rejection of Claims 1-3, 5-8 and 11-12 under 35 U.S.C. 103(a) as being unpatentable over Shigeta (4,956,131), in view of WO99/13989 and further supported by JP 59042781 is withdrawn due to the ineffective date of the WO reference.

***Examiner Correspondence***

8. Any inquiry regarding this communication or a previous communication should be directed to Examiner Mark Ruthkosky, Ph.D., whose telephone number is (703) 305-0587 or his acting supervisors, Carol Chaney, whose telephone number is (703) 305-3777 or Steve Kalafut, whose telephone number is (703) 308-0433. Please note that Examiner Ruthkosky is out of the office the first Friday of each bi-week period.

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The art unit 1745 unofficial fax number is 703-306-3429, while the PTO official fax number is 703-305-3599.

*Carol Chaney*  
**CAROL CHANEY**  
**PRIMARY EXAMINER**

12-4-2000.